

REMARKS

The application has been reviewed in light of the Office Action mailed on February 6, 2003. Claims 1-12 are pending in the application with Claims 1, 8 and 9 being in independent form. By the present amendment, the drawings, the specification and Claims 1, 2, 4, 5, 7, 8, 9, 11 and 12 have been amended and independent Claims 13 and 14 have been added. No new matter or issues are believed to be introduced by the amendments.

The Office Action does not include a substantive rejection (other than a rejection under 35 U.S.C. §112, second paragraph) for dependent Claims 2, 3 and 7. It is therefore Applicant's belief that these claims would be allowable if rewritten to overcome the rejection under 35 U.S.C. §112, second paragraph, and in independent form including the limitations of the base claim and any intervening claims.

In the Office Action, the disclosure was objected to due to several informalities. The disclosure has been amended in a manner which is believed to obviate the objection. Accordingly, withdrawal of the objection is respectfully requested.

I. Rejection of Claims 1-7, 8, 9, 10, 11 and 12 Under 35 U.S.C. §112

Claims 1-12 were rejected under 35 U.S.C. §112, second paragraph. Claims 1, 4, 5, 7, 8, 9, 11 and 12 were amended in a manner which is believed to overcome the rejection. Accordingly, withdrawal of the rejection under 35 U.S.C §112 with respect to Claims 1-12 is respectfully requested.

II. Amendments to the drawings

Changes have been made to the drawings which more clearly illustrate the present invention and which obviate the objection to the drawings. In FIG. 2, item 70 has been renumbered as 70a and numeral 70b has been added. In FIG. 4c, items numbered 60, 62, 64, 66, 68 and 70 have been renumbered as 60a, 62a, 64a, 66a, 68a and 70a, respectively, to better conform to the specification. In FIG. 4a, item 72b located in the input cavity 12 portion of the illustrated structure has been renumbered as 72a to better conform to the specification. FIGs. 3 and 4b have not been amended. Accordingly, withdrawal of the objection is respectfully requested.

III. Rejection of Claims 1, 4 and 9 Under 35 U.S.C. §103(a)

Claims 1, 4 and 9 were rejected under 35 U.S.C. §103(a) over U.S. Patent No. 4,562,409 issued to Saito et al. ("Saito et al."). Applicant has amended Claims 1 and 9 in a manner which is believed to better define Applicant's invention and to overcome the rejection under 35 U.S.C. §103(a) over Saito et al.

Saito et al. disclose the implementation of amplifiers as denoted by the AMP labeled elements shown by FIG. 8. Due to the nature of the prior art device as disclosed in Saito et al., however, the AMP elements cannot simply be replaced by discrete transistor elements. RF signals generally have impedances standardized at either 50 or 75Ω while the input impedance of a transistor is on the order of only a few ohms. This impedance mismatch must be dealt with by impedance matching circuitry located between the RF input signal and the transistor; this impedance mismatch is present on the output side also and thus similar impedance match circuitry is needed on the output side between the

transistor and load. Without impedance matching, the circuitry would not function properly, therefore, an amplifier, as defined by those skilled in the field of RF Electronics, comprises input impedance matching circuitry, a vacuum tube, transistor or other suitable active circuit element, and output impedance matching circuitry. In this definition of an amplifier, the transistor is only one of many components found within the circuit. In fact, Saito et al. discloses the need for a complex amplifier circuit and not a simple discrete amplifying electronic component for use with the disclosed microwave integrated circuit. See, e.g., column 4, lines 15-21.

Applicant avoids the use of complex amplifier circuitry through the novel design and implementation of a housing defining an input cavity, an output cavity and at least one gap for each of the input and output cavities; a first conducting assembly having a plurality of conductors, each conductor is configured to contact a respective input lead of a plurality of transistors for coupling the RF field in the input cavity to the input leads of the plurality of transistors via the at least one gap of the input cavity; and a second conducting assembly having a plurality of conductors, each conductor is configured to contact a respective output lead of the plurality of transistors for inducing an RF field in the output cavity coupled to the output leads of the plurality of transistors via the at least one gap of the output cavity to amplify the RF power from the source. As recited above and by the claims, each of the at least one gaps of Applicant's active radio frequency cavity amplifier provides a low impedance coupling between its respective cavity and an individual transistor of the plurality of transistors without the need for additional circuitry as is required by the prior art.

In particular, Applicant's Claim 1 recites, "An active radio frequency cavity amplifier comprising: a housing defining an input cavity, an output cavity and at least one gap for each of the input and output cavities; a plurality of transistors mounted to said housing, each of said plurality of transistors having a respective input lead and a respective output lead; a first RF power coupling mechanism disposed within the housing in proximity to the input cavity for coupling RF power from a source into the input cavity to generate an RF field; a first conducting assembly having a plurality of conductors, each conductor configured to contact a respective input lead of the plurality of transistors for coupling the RF field in the input cavity to the input leads of the plurality of transistors via the at least one gap of the input cavity; a second conducting assembly having a plurality of conductors, each conductor configured to contact a respective output lead of the plurality of transistors for inducing an RF field in the output cavity coupled to the output leads of said plurality of transistors via at least one gap of the output cavity to amplify the RF power from the source; and a second RF power coupling mechanism disposed within the housing in proximity to the output cavity for coupling amplified RF power from the output cavity to a load." (Emphasis added).

Similar recitations as the recitations added to Claim 1 have been added to independent Claim 9. Accordingly, withdrawal of the rejection with respect to Claims 1 and 9 under 35 U.S.C. §103(a) and allowance thereof are respectfully requested.

Claim 4 depends from Claim 1 and therefore includes the limitations of Claim 1. Therefore, for at least the same reasons given above for Claim 1, Claim 4 is patentably

distinct over Saito et al. Accordingly, withdrawal of the rejection with respect to Claim 4 under 35 U.S.C. § 103(a) and allowance thereof are respectfully requested.

IV. Rejection of Claims 5, 6, 8, 10, 11 and 12 Under 35 U.S.C. §103(a)

Claims 5, 6, 8, 10, 11 and 12 were rejected under 35 U.S.C. §103(a) over Saito et al. in view of U.S. Patent No. 4,686,494 issued to Kaneko et al. ("Kaneko et al.").

Claims 5 and 6 depend from Claim 1 and Claim 10 depends from Claim 9 and therefore include the limitations of Claims 1 and 9, respectively. Therefore, for at least the reasons given above for Claims 1 and 9, Claims 5, 6 and 10 are patentably distinct over Saito et al.

Kaneko et al. does not cure the deficiencies of Saito et al. Kaneko et al. does not disclose or suggest the use of at least one gap as recited by Applicant's Claims 1 and 9. It therefore follows that Saito et al. and Kaneko et al., taken alone or in any proper combination, do not disclose or suggest Applicant's invention as recited by Claims 1 and 9. Therefore, Claims 5, 6 and 10 are patentably distinct over Saito et al. in view of Kaneko et al., taken alone or in any proper combination. Accordingly, withdrawal of the rejection with respect to Claims 5, 6 and 10 under 35 U.S.C. § 103(a) and allowance thereof are respectfully requested.

Applicant's Claims 8 and 11 have been amended to include similar recitations to the recitations added to Claims 1 and 9. In particular, Applicant's Claim 8 recites "A method for amplifying RF power comprising the steps of: coupling RF power to an active radio frequency cavity amplifier comprising a housing defining an input cavity, an output cavity and at least one gap for the input and output cavities and a plurality of transistors

mounted in proximity to said input and output cavities and each of said plurality of transistors having a respective input lead and a respective output lead; tuning the resonant frequency of the input cavity and the resonant frequency of the output cavity; coupling the RF field in the input cavity to the input leads of the plurality of transistors via the at least one gap of the input cavity; inducing an amplified RF field in the output cavity coupled to the output leads of the plurality of transistors via the at least one gap of the output cavity; and coupling amplified RF power from the output cavity." (Emphasis added)

Applicant's Claim 11 recites "An RF power amplifier comprising: means for coupling RF power to an active radio frequency cavity amplifier comprising a housing defining an input cavity, an output cavity, and at least one gap for the input and output cavities; means for coupling an RF field within the input cavity, wherein a plurality of transistors are mounted in proximity to said at least one gap for the input and output cavities and each of said plurality of transistors having a respective input lead and a respective output lead; and means for tuning the resonant frequency of the input cavity and the resonant frequency of the output cavity." (Emphasis added)

Neither Saito et al. nor Kaneko et al. disclose or suggest at least the newly added limitations to Claims 8 and 11. Accordingly, withdrawal of the rejection with respect to Claims 8 and 11 under 35 U.S.C. §103(a) and allowance thereof are respectfully requested.

Claim 12 depends from Claim 11 and therefore includes the limitations of Claim 11. Therefore, for at least the same reasons given above for Claim 11, Claim 12 is patentably distinct over Saito et al. and Kaneko et al., taken alone or in any proper

combination. Accordingly, withdrawal of the rejection with respect to Claim 12 under 35 U.S.C. § 103(a) and allowance thereof are respectfully requested.

V. New Claims 13-14

New Claim 13 is analogous to original Claim 1 as rewritten to overcome the rejection under 35 U.S.C. §112, second paragraph, and to include several of the limitations of original Claim 2. Since the Office Action, does not cite a substantive rejection (other than a rejection under 35 U.S.C. §112, second paragraph) with respect to original Claim 2, it is Applicant's belief that original Claim 2 contains patentable subject matter. Accordingly, Applicant submits that new Claim 13 includes patentable subject matter and is therefore in condition for allowance.

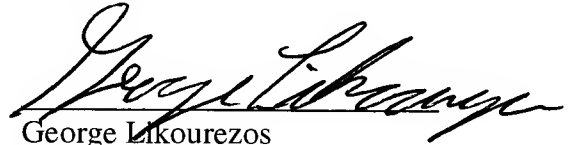
New Claim 14 includes similar recitations to the recitations added to Claims 1, 8, 9 and 11. Accordingly, it is believed that Claim 14 is patentably distinct over the cited references for at least the same reasons given for Claims 1, 8, 9 and 11 and therefore, allowance of Claim14 is earnestly solicited.

VI. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that all claims presently pending in the application, namely, Claims 1-14, are believed to be in condition for allowance and patentably distinguishable over the art of record.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call Applicant's undersigned attorney at the number indicated below.

Respectfully submitted,



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